years the mortality from this disease has been reduced to nearly one-fifth the former rate.

The most stupendous task to which the medical profession has ever put its hands is the crusade against tuberculosis, the preeminence of which as the leading cause of death in all communities is already threatened. Sufficient knowledge of the causation and mode of spread of this disease has been gained within the last quarter of a century to bring within the possible bounds of realisation the hopes of even the most enthusiastic, but it will require a long time, much patience, and a combination of all the forces of society, medical, legislative, educational, philanthropic, sociological, to attain this goal.

But great and rapid as the progress has been, it is small in comparison with what remains to be done. The new fields which have been opened have been explored only in relatively small part. There still remain important infectious diseases the secrets of which have not been unlocked. Even with some the causative agents of which are known, notably pneumonia and other acute respiratory affections and epidemic meningitis, very little has yet been achieved by way of prevention. The domain of artificial immunity and of the treatment of infections by specific sera and vaccines, so auspiciously opened by Pasteur and by Behring, is still full of difficult problems the solution of which may be of immense service in the warfare against disease. Of the cause of cancer and other malignant tumours nothing is known, although many workers with considerable resources at their disposal are engaged in its study. With the change in the incidence of disease, due at least in large part to the repression of the infections of early life, increased importance attaches to the study of the circulatory, renal, and nervous diseases of later life, of the underlying causes of which we are very imperfectly informed. There are and will arise medical problems enough of supreme importance to inspire workers for generations to come and to make demands upon all available resources.

In full recognition of the dependence of success in the warfare with disease upon increase of knowledge, the Rockefeller Institute for Medical Research was founded by the enlightened munificence of Mr. John D. Rockefeller, to whom grateful acknowledgment is made. Likewise to the broad sympathies and active interest of his son, Mr. John D. Rockefeller, jun., the origin and development of this institute are largely indebted.

May the hopes of the founder and of those who have planned this institute be abundantly fulfilled! May it contribute largely to the advancement of knowledge, and may the streams of knowledge which flow from it be "for the healing of the nations."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

A RECENT report of President Butler, of Columbia University, refers to the salaries paid to the professors and adjunct professors of the University. This part of the report was reprinted in *Science* for November 23. President Butler says that these salaries are inadequate, and that the effects of this inadequacy are deplorable. The report shows that the present average salary paid to a Columbia University professor is but one-half of the sum fixed as necessary thirty years ago, and that the cost of living has meanwhile increased between 10 per cent. and 20 per cent. The purchasing power of the average salary of 1906 is, therefore, hardly more than 40 per cent. of the purchasing power of the salary established in 1876. In other words, the great expansion of the University, which has been brought about by the labours of the university teachers, has also been brought about at their expense. In President Butler's judgment the most important need of Columbia University at the present time is an addition to the endowment fund sufficient to enable the establishment and maintenance of a proper standard of compensation to members of the teaching staff. There are 119 professors and thirty-nine adjunct professors, 158 in all. To increase the salary of each by only 200*l*. on an average—not at all an adequate amount—would absorb the interest at 5 per cent. on a capital sum of more than 600,000*l*. The need is so imperative and the public interests affected by it are so important, the report states, that the mere statement of it ought to bring the needed sum, great though it is, from the American men and women who are the large-minded possessors of wealth.

THE scheme for the establishment at Bristol of a university for the west of England is now taking definite shape. The sum of 40,000*l*. has already been promised, and with the buildings of University College, which are worth about another 50,000*l*., the scheme may be said to have made a good start. There was a difficulty in arriving at an arrangement between the Merchant Venturers' work in higher education and that of University College, but we understand that the Merchant Venturers have practically accepted the principle of the proposed university, and though details remain to be settled, there is good reason to believe that the movement will now go forward with every promise of success. Speaking at the Merchant Venturers' Technical College, Bristol, on December 20, Prof. M. E. Sadler referred to the energy with which the Merchant Venturers had furthered the work of technical instruction, and expressed the hope that it would be found possible to unite the Technical College with the University College, and thus to form the nucleus of a great University of Bristol. Under modern conditions universities should combine opportunities for advanced technological, commercial, and professional training with the highest tradition of literary and philosophical culture. There is still room, in spite of other recent foundations, for a new university in England with its seat at Bristol; but the nation will not gain by the establishment of a university weak because ill-endowed and insufficiently equipped with teachers, laboratories, libraries, and the buildings indispensable to the social side of university life. The rapid growth of Bristol in recent years encourages the hope that its citizens will emulate the example of Manchester, Liverpool, Birmingham, Leeds, and Sheffield in the building up of a great modern university.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 8.—"On the Occurrence of Encystation in *Trypanosoma grayi*, Novy, with Remarks on the Method of Infection in Trypanosomes Generally." By Prof. E. A. **Minchin**. Communicated by Prof. Ray Lankester.

In a former communication to NATURE (November 15, p. 56) an account was given of the results obtained by the Sleeping Sickness Commission at Entebbe, Uganda, with regard to the transmission of the *Trypanosoma gambiense* of sleeping sickness, and other trypanosomes, by *Glossina palpalis*, the dusky tsetse-fly.[1] It was shown (1) that the infection was a "direct mechanical" transmission by the proboscis, and that no "cyclical" infection, comparable to that of malaria, could be discovered; (2) that *T. gambiense* appeared to die out in the intestine of the fly after ninety-six hours; (3) that besides *T. gambiense*, the fly carried two other species of trypanosomes, named *T. grayi* and *T. tullochii* respectively.

Since the article referred to was written, it has been found that *T. grayi* becomes encysted in the hind-gut of the fly, and all analogies with other Protozoa suggest that the cysts are destined to be cast out and infect fresh hosts, probably, in this case, the vertebrate hosts from which the fly obtains the trypanosomes. This suggests the occurrence of a hitherto unsuspected mode of infection by trypanosomes, in which the parasites, when taken up from the blood of the vertebrate by the blood-sucking invertebrate, pass, in the gut of the latter, through a developmental cycle, which ends in the parasites becoming encysted. In this condition they are cast out and re-infect the vertebrate host by contaminating its food or drink. Such a mode of infection is termed "contaminative," as contrasted with the "inoculative" method seen in malaria, and hitherto vainly sought for in these trypanosomes.

[1] Mr. E. E. Austen, of the Natural History Museum, has suggested to the author that *Glossina palpalis* should be distinguished in this way from the other seven known species of tsetse-flies.

Moreover, as it may be supposed that what one species of trypanosome does another may do, the encystation seen in *T. grayi* arouses the suspicion that the disappearance of *T. gambiense* from the gut of the fly may be due also to a similar cause.

Society of Chemical Industry, December 3.—Dr. J. Lewkowitsch in the chair.—The direct estimation of antimony: H. W. **Rowell.** The sample of finely powdered ore or fine metallic sawings containing about 0·14 gram of antimony is weighed into a 500 c.c. beaker and dissolved in 25 c.c. of strong hydrochloric acid. 5 c.c. of saturated solution of bromine in hydrochloric acid are run in, and any insoluble matter is fused in caustic soda and returned to the main bulk. Three grams of sodium sulphite are added, and the mixture boiled down to 10 c.c. to drive off sulphurous acid and arsenic. The solution is titrated at a boiling temperature, after the addition of 60 c.c. of hydrochloric acid (1–3), with N/20 potassium bromate until the colour of the methyl orange indicator is destroyed. The bromate is standardised with 0·082 gram of arsenious oxide dissolved in hydrochloric acid, which is equivalent to 0·1 gram of antimony. Copper raises the result slightly, and iron very slightly, but precautions are given for obviating their effect. The method may be applied to materials containing antimony, and examples are given illustrating the accuracy of the method, the effect of copper and variations in samples of alloys.—The detannisation of solutions in the analysis of tanning materials: Dr. J. Gordon **Parker** and H. Garner **Bennett.** The authors deal with the four chief methods used for the analysis of tanning materials and extracts, and compare the official method of the International Association of Leather Trades Chemists, which consists of detannisation by means of a column of prepared hide-powder in a specially made filter bell, with the German method, with the method devised by Kopecky, and, finally, with the official American method. The authors confirm the work that has been done by Reed and other American chemists, and disprove the claims made by Paessler that a dry chromed hide-powder used in the filter bell gives the most accurate results. The authors finally recommend that the International Association of Leather Trades Chemists should at once adopt the American method, either as it now officially stands or in a modified form.

Geological Society, December 5.—Sir Archibald Geikie, Sec.R.S., president, in the chair.—The geological conditions which have contributed to the success of the artesian boring for water at Lincoln: Prof. E. **Hull.** This boring has its source of supply in strata which rise to the west, but to the east dip down towards the North Sea. The water-yielding stratum is reddish, soft, porous, sand-rock, reached at a depth of 1561 feet, and penetrated to a depth of 474 feet. About one million gallons of water rise to the surface daily. The sand-rock belongs to the New Red Sandstone. The hydraulic pressure at the bottom of the boring is that due to about 2035 feet, and the friction of the water in percolating the rock accounts for the fact that the water can be pumped down during the day, but rises again in the night. The formations penetrated are:—Alluvium and Lower Lias, 641 feet; Rhætic beds, 52 feet; Red Marl and Lower Keuper Sandstone, 868 feet; Bunter Sandstone, 454 feet. The quantity of water drawn from the New Red Sandstone amounts to not less than twenty million gallons, and the total available quantity of water percolating into the Sandstone amounts to about 300 millions.—Notes on the raised beaches of Taltal (northern Chile): O. H. **Evans.** The town of Taltal is situated partly on the dry bed of a river and partly on an inclined plain that fringes the bays of the coastal ranges to the northward, and runs up the valleys. The material of this plain consists of sands and rounded gravel derived from the rocks of the adjacent hills, mingled with shells and some isolated boulders. The formation is impregnated with salt, and there protrude through it weathered remnants of former stacks and islets. The plain rises in terraces, the highest of which are somewhat obscure, and sometimes portions of these higher terraces are preserved in the stacks and islets. A second coastal shelf also occurs, marked by a line of shallow caverns. Beds of shells in the gravel, containing whale-bones, give evidence of the marine origin of the terraces.

Chemical Society, December 6.—Prof R. Meldola, F.R.S., in the chair.—Action of reducing agents on 5-chloro-3-keto-1 : 1-dimethyl-Δ^4-tetrahydrobenzene: A. W. **Crossley** and Miss N. **Renouf.** Sodium in moist ethereal solution gives, as main product, 3-hydroxy-1 : 1-dimethylhexahydrobenzene, whereas sodium in absolute alcoholic solution yields a small amount of this alcohol, and to a much larger extent 3-hydroxy-5-ethoxy : 1 : 1-dimethylhexahydrobenzene. With zinc filings in aqueous solution, either in the cold or on heating, 3-keto-1 : 1-dimethyl-Δ^4-tetrahydrobenzene is formed, but zinc dust in either glacial or dilute acetic acid gives rise to 3-keto-1 : 1-dimethylhexahydrobenzene.—A new trinitroacetaminophenol and its use as a synthetical agent: R. **Meldola.** Mononitrodiacetylaminophenol, when dissolved in a mixture of fuming nitric and strong sulphuric acids, yields 2 : 3 : 5-trinitro-*p*-acetaminophenol, which is remarkably active as a synthetical agent owing to the extreme mobility of one (position 3) of the nitro-groups. By the action of various amines on the trinitro-compound, substituted benziminazoles are produced.—Pinene nitrolamine: F. P. **Leach.** This nitrolamine and a number of its derivatives are described.—A *pseudo*-semicarbazide from pinene: F. P. **Leach.**—Some derivatives of benzophenone. Synthesis of substances occurring in coto-bark. Preliminary notice: W. H. **Perkin,** jun., and R. **Robinson.** 2 : 4 : 6 : 3′ : 4′-Pentamethoxybenzophenone, $(MeO)_2C_6H_3.CO.C_6H_2(OMe)_3$ (pentamethylmaclurin), is obtained when aluminium chloride reacts with a mixture of veratryl chloride and phloroglucinol trimethyl ether in presence of carbon disulphide. 3′ : 4′-Methylenedioxy-2 : 4 : 6-trimethoxybenzophenone,

$$CH_2 : O_2 : C_6H_3.CO.C_6H_2(OMe)_3$$

(oxyleucotin), was synthesised by treating a mixture of piperonyl chloride and phloroglucinol trimethyl ether in carbon disulphide solution with aluminium chloride. The syntheses of other related products by similar reactions are also described.—The liquid volume of a dissolved substance: J. S. **Lumsden.** Experimental results are recorded which prove that the following law holds, though certain irregularities due to the influence of the solvent exist. When a substance in the liquid state dissolves without change of volume, the same substance when in the state of solid or gas will, when dissolved in the same solvent, change to the volume which the same weight of it would have if it were a pure liquid at the temperature of solution.—A synthesis of terebic, terpenylic, and homoterpenylic acids: J. L. **Simonsen.** These three acids were synthesised from ethyl acetylsuccinate, ethyl β-acetylglutarate, and ethyl β-acetyladipate respectively by means of magnesium methyl iodide.—Influence of light on diazo-reactions, part i.: K. J. P. **Orton,** J. E. **Coates,** and (in part) F. **Burdett.** Solutions of diazonium salts in water, methyl or ethyl alcohol, acetic or formic acid, decompose rapidly on exposure to light, the product of the reaction depending on the solvent.—The viscosity of liquid mixtures: A. E. **Dunstan** and R. W. **Wilson.** Viscosity concentration curves of mixtures of water and sulphuric acid show a well-defined maximum point corresponding with H_2SO_4,H_2O, and a minimum corresponding with $3H_2SO_4,2H_2O$.

Linnean Society, December 6.—Prof. A. W. Herdman F.R.S., president, in the chair.—The physiology of the museum beetle, *Anthrenus museorum* (Linn.), Fabr.: Prof. A. J. **Ewart.** The mischief wrought by this species in the National Herbarium at Melbourne is great, and is only kept in check by systematic use of a chamber impregnated by the vapour of carbon-bisulphide, in which the plants are placed for several days at a time. The use of corrosive sublimate is not advisable owing to the grave danger to health in a dust-forming atmosphere. The most remarkable feature of the larvæ is their power of feeding on dry material with less than 9 per cent. of water, and yet these larvæ exhibit the usual amount in their structure, averaging 70 per cent. The author suggests that the water may be

chemically derived from decomposition of the carbohydrate food they consume. Bacteria are present in abundance in the alimentary canal of these grubs, and oxidise the carbon of the food where no transpiration of water is possible.—Note on the origin of the name Chermes or Kermes: E. R. **Burdon.** The existence of the same generic name in two families of the Hemiptera is due to the following causes:—(1) that the dye-insect of the oak, *Quercus ilex*, Linn., had been known since the Arab conquest of Spain by the popular name of Kermes all over the south of Europe. (2) That Linnæus, apparently unaware of this fact, put the Kermes dye-insect into the genus Coccus, and employed Chermes as the generic name for another group of insects, amongst which he placed the spruce gall-insect. (3) That Geoffroy, objecting to this misapplication of a well-known popular name, used Chermes as the generic name for the dye-insect which Linnæus called Coccus. (4) That Boitard used the name for the same insects as Geoffroy, but spelt it Kermes. (5) That the majority of workers at the spruce gall-insects have retained the Linnæan name of Chermes, and at the same time Coccid authorities have naturally continued to use the name Kermes for the insect which had popularly been so-called from early times. The author concludes that, in view of the wide acceptance of both Chermes and Kermes, any alteration would only make confusion worse confounded.—Part x. of the reports on Biscayan plankton collected by H.M.S. *Research* in 1900: E. W. L. **Holt** and L. W. **Byrne.** An account was given of the fishes captured. It was remarkable that no fish-eggs or larvæ were taken in any of the thirty-seven hauls of the closing-net which explored the water between 2000 fathoms and fifty fathoms; they appeared to be confined to the upper 100 fathoms, and were rare at the surface. Nine species and six genera were recognisable, the deepest of which was *Gonostomà bathyphilum*, taken in the closing-trawl between 2000 fathoms and 1500 fathoms. Several unknown larvæ are described and figured.

Royal Meteorological Society, December 19.—Mr. Richard Bentley, president, in the chair.—The Guildford storm of August 2, 1906: Admiral J. P. **Maclear.** This storm shows some very curious and interesting features in the remarkable violence of the wind, rain, and hail within a small area, and the suddenness with which it burst. There was an area of thunderstorms over the whole of the south of England on the evening of that day. The most violent storm, however, burst over Grayshott, on Hindhead, at 8.20, and pursued a narrow track through Godalming and Guildford to Ripley, five miles north-east of Guildford. The wind was of hurricane force, and blew down an immense number of trees and caused other damage, and also the loss of two lives. The rain, accompanied by large hailstones, was very heavy, as much as 1·17 inches falling at Grayshott in fifteen minutes. There was a magnificent display of lightning.—The metric system in meteorology: R. **Inwards.** The author did not discuss the general question of the advantages of the metric system over that in use by Britain and her colonies and the United States of America, but confined his remarks to the advisability of adopting some uniform system by all the meteorological observers upon the globe.

MANCHESTER.

Literary and Philosophical Society, November 27.—Prof. A. Schuster, F.R.S., in the chair.—Some Points of chemical philosophy involved in the discovery of radium and the properties of its combinations: Dr. H. **Wilde.**—A collection of land and fresh-water Mollusca collected by Mr. S. A. Neave in North-East Rhodesia: J. Cosmo **Melvill** and R. **Standen.** The areas traversed by Mr. Neave were mainly the high plateaux and mountainous lands between the Loangwa and Kafue Rivers, at an elevation of 2000 feet to 4200 feet. Mollusca were, in certain places (particularly Kapopo, in the limestone district), plentiful in individuals, but deficient in number of species. Most notable were the large agate-snails (Burtoa, Achatina, and Limicolaria), of which one elegant form, *A. rhodesiaca*, remarkable for its attenuately-fusiform contour, is new to science. *Cleopatra mterizensis*, one of a fluviatile genus, endemic in the African continent, is also until now undescribed, as is an interesting member of the sinistral genus Lanistes, which occurred at Kapopo, and is to bear the name of *L. neavei*, after its discoverer. Only twenty-two species are gathered in all, the majority being already known as natives of German East Africa, the Nyassa district, the neighbourhood of Victoria Nyanza or the Zambezi River. Little specific affinity seems to exist with the Transvaal or South Africa, excepting so far as some widely distributed species, *e.g. Melania tuberculata*, Will., and *Physopsis africana*, Krauss, are concerned.

DIARY OF SOCIETIES.

SATURDAY, DECEMBER 29.

ROYAL INSTITUTION, at 3.—Signalling to a Distance; the Invention of the Electric Telegraph: W. Duddell.

MONDAY, DECEMBER 31.

LONDON INSTITUTION, at 4.—Volcanoes: W. Herbert Garrison.

TUESDAY, JANUARY 1.

ROYAL INSTITUTION, at 3.—Signalling to a Distance: Modern Electric Telegraphs: W. Duddell.

WEDNESDAY, JANUARY 2.

SOCIETY OF ARTS, at 5.—Perils and Adventures Underground (Juvenile Lecture): B. H. Brough.

LONDON INSTITUTION, at 4.—The Fire Belt around the Globe: W. Herbert Garrison.

THURSDAY, JANUARY 3.

ROYAL INSTITUTION, at 3.—Signalling to a Distance: the Telephone and its Working: W. Duddell.

FRIDAY, JANUARY 4.

LONDON INSTITUTION, at 4.—Earthquakes and Geysers: W. Herbert Garrison.

ROYAL GEOGRAPHICAL SOCIETY, at 3.30.—Japan and the Japanese as I saw them: Miss A. L. Murcutt.

SATURDAY, JANUARY 5.

ROYAL INSTITUTION, at 3.—Signalling to a Distance: Early Wireless Telegraphs: W. Duddell.

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